MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2017/2018

BDS2874 – MANAGEMENT DECISION SCIENCE

(All sections / Groups)

11 OCTOBER 2017
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **FIVE (5)** printed pages excluding cover page with:
   Section A: Ten (10) multiple choice questions (20%)
   Section B: Three (3) structured questions (80%)

2. Answer **ALL** questions.

3. Answer **Section A** in the multiple-choice answer sheet provided and **Section B** in the answer booklet provided.

SECTION A: MULTIPLE CHOICE QUESTIONS (20 MARKS)

There are TEN (10) questions in this section. Answer ALL questions on the multiple choice answer sheet.

1. Impact of changes in RHS values of constraints is typically measured by the:
   A. Shadow price
   B. Objective function coefficients
   C. Reduced cost
   D. RHS allowable increase value

2. Consider the following linear programming model:

   Objective function, Minimize: $3X_1 + 2X_2 + 6X_3^2$
   subject to:

   $4X_1 - 7X_2 \leq 36$
   $2X_2 + 9X_3 \leq 18$
   $X_1, X_2, X_3 \geq 0$

   Which of the following assumption has violated the above model?
   A. certainty
   B. linearity
   C. integrality
   D. proportionality

3. To determine the sensitivity range for the coefficient of a variable in the objective function, calculations are performed such that all values in the $C_j - Z_j$ row are _____.
   A. greater than the objective function value
   B. equal to one
   C. less than or equal to zero
   D. more than or equal to zero

4. Given the following linear programming problem:

   Maximize, $Z = 4X + 3Y$
   subject to:
   $5X - 8Y \leq 34$
   $3X + 2Y \leq 17$
   $X, Y \geq 0$

   How many of the slack variables need to include in initial Simplex table?
   A. 1
   B. 3
   C. 4
   D. 2

Continued...

5. Slack variables are added to _____ constraints and represent unused resources.
   A. ≤
   B. <
   C. >
   D. =

6. What is the EOQ value when D = 80 unit per year, C_0 = \$13 and C_h = \$11?
   A. 80 unit
   B. 13.75 unit
   C. 17.73 unit
   D. 11 unit

7. Ahmad manages an office supply store which is the printer toner. Ahmad knows that 10,000 boxes will be sold per year at constant rate throughout the year. There are 250 working days per year and the lead time is 3 days. The ordering cost is RM 30 while the holding cost is RM 15 per box/year. How many units should Ali order each time?
   A. 30
   B. 400
   C. 200
   D. 1000

8. Which of the following **does not** have an impact on EOQ?
   A. holding cost
   B. order cost
   C. annually demand
   D. safety stock

9. Sensitivity analysis of EOQ refer to
   A. analysis of how much the EOQ will change if different input values are used.
   B. the attitude of top management toward the use of the EOQ model.
   C. analysis of the impact of stock shortages.
   D. an assessment of the impact of obsolescence upon the EOQ.

10. Kushie's Coffee serves coffee to a clientele for over fifty years. The demand for coffee beans is 6600 bags per year. A coffee is a perishable product, the holding cost is fairly high at \$40 per year. The lead time is seven days. Kushie's is open 300 days a year. Determine their reorder point.
    A. 6600 bags
    B. 154 bags
    C. 300 bags
    D. 451 bags

Continued...

SECTION B: STRUCTURED QUESTIONS (80 Marks)

There are THREE questions in this section. Candidates MUST answer ALL THREE questions.

Question 1 (30 Marks)

(a) Pee Lah Company manufactures office chairs in two factories and ships them to four distribution points. The following table shows the cost per unit (in MYR), capacity and demand for the company:

From	To				Supply
	E	F	G	H	
A	8	7	11	10	150
B	11	8	9	11	100
Demand	70	60	90	30	

Initiate the solution using **Vogel's Approximation Method (VAM)** and find the minimum total transportation cost.

(10 marks)

(b) The following table shows the estimated project completion time (in weeks):

Leader	Project		
	A1	A2	A3
Ahmad	9	12	8
Badar	11	13	10
Che Man	12	14	10
Daud	13	15	13

Determine the assignment of leaders to projects using the Hungarian Method to minimize the completion time.

(20 marks)

Continued...

Question 2 (25 Marks)

Mun Yen company is awarded a project. The activities involved in the project are as follows:

Activity	Immediate Predecessors	Time (weeks)		
		Optimistic	Most Likely	Pessimistic
A	-	7	9	17
B	A	2	4	6
C	A	4	5	6
D	A	2	3	10
E	B	1	2	3
F	B	2	3	4
G	C,F	1	2	3
H	D	2	3	4
I	H	2	3	4
J	G,I	1	2	3
K	E,J	1	2	3

(a) Construct a network diagram for this project.

(8 marks)

(b) Determine the critical path and the expected project completion time. Compute the earliest start time, latest start time, earliest finish time, latest finish time and slack time.

(17 marks)

Continued...

Question 3 (25 Marks)

Pak Nan company is going to introduce one of the three dishes: Salted Fish Rice, Tomato Chicken Rice and Taufu Rice. As the market conditions affect the payoffs of the new dishes, the company estimates the following payoffs:

Product	Market condition		
	Favourable (MYR)	Stable (MYR)	Unfavourable (MYR)
Salted Fish Rice	1800	900	100
Tomato Chicken Rice	1200	700	200
Taufu Rice	1100	1000	160

(a) Select best alternative based on Maximax.

(4 marks)

(b) What is the company's decision using Maximin?

(4 marks)

(c) Determine the best alternative using Equally Likely.

(5 marks)

(d) Find the best strategy through Criterion of Realism ($\alpha = 0.7$).

(6 marks)

(e) What is the best decision for the company using Minimax Regret?

(6 marks)

End of Page